CHAPTER 2 - PHYSICAL CHARACTERISTICS & NATURAL AND HISTORIC RESOURCES

INTRODUCTION

Fauquier County, located approximately 40 miles west of the Nation's Capital in northern Virginia, is roughly rectangular in shape and covers approximately 660 square miles. The County is bounded to the west by Culpeper and Rappahannock counties, to the south by Stafford County, to the north by Loudoun, Warren, and Clarke counties, and to the east by Prince William County. The County spans three geological provinces- the Blue Ridge, the Culpeper (Triassic Basin), and the Piedmont. The northwestern half of the County, which is dominated by the Blue Ridge, is characterized by mountainous and rolling terrain, while the central portion, which is dominated by the Culpeper Basin, is nearly level to gently rolling. The extreme southeastern portion, which is dominated by the Piedmont, is gently rolling to rolling in nature. Forest vegetation covers approximately one-third of the County's land area, while the remainder is largely open land utilized for a variety of agricultural purposes.

The diverse geological character of Fauquier County has resulted in an area which is abundantly rich in natural resources and a physiography which is exceptionally scenic in nature. In addition, the underlying geology of the County in many cases will dictate the most appropriate land use for a particular area, as well as affects the quantity and quality of groundwater and the fertility and development capability of local soils.

Fauquier County has long realized the critical balance between its natural resources and development. The 1967 Plan discussed these resources and in fact served as a beginning toward ensuring their rational use. Natural resources are in some cases delicate and in most cases finite in their availability, and they will become increasingly critical as the population of the County continues to grow. It is the responsibility of the County to understand and protect the critical balance between the County's natural resources with the public costs and benefits of development.

In addition to its natural resources, Fauquier County has an abundance of historical features which include places and structures. These features form the history and character of the County.

The remainder of this chapter will inventory the environmental, ecological, and historical resources of Fauquier County. This inventory will better enable the County to manage and conserve existing resources as well as to plan for anticipated growth. The location of groundwater resources, their quality and quantity, will be a major determining factor in the rate and composition of growth within the County. Further, the following inventory will serve as the technical framework for land use decisions in this Comprehensive Plan.

TECHNICAL ANALYSIS

Location and Access

Fauquier County is bordered on the east by the Washington Standard Metropolitan Statistical Area and is approximately 40 miles from the Nation's Capital as shown on Map 2.1 (*Location Map of Fauquier County Virginia*). Access to and from the County is presently provided by four primary highways (Routes 29, 55, 211, and 28) and an interstate highway (Route 66) which traverse the County in an east-west direction. The County is also traversed in a north-south direction by a primary highway (Route 17). The largest existing population center is the Town of Warrenton which is located approximately in the geographic center of the County. Nearly 4,800 people reside in the Town of Warrenton which is also the commercial center of the County. The Warrenton Service District, which surrounds the town, is home to an additional 4,800 persons. There are three other Service Districts in the County ranging in size from 1,100 to 5,800 persons as well as the Villages and Settlements which provide for the social and limited commercial requirements of the rural population.

Railroad service in the County is provided by a "main line" which traverses the southern portion of the county in an east-west direction, roughly paralleling Route 28. A "spur" of this railroad runs north from Calverton to the quarry. Another railroad line also traverses the northern portion of the County in an east-west direction and roughly parallel to Route 55.

Airport facilities are provided by a general utility facility in Midland. The County purchased the airport in 1992 and will continue to run the facility as a general utility airport.

Geology

Fauquier County covers a geologically diverse area which manifests itself in a variety of unique and scenic landforms. An understanding of the geology of the County is vital to its continued economic prosperity and well managed development. For example, study of the underlying geology is necessary to determine site suitability for septic systems as well as the need for slope stabilization.

Soils, in particular, derive their characteristics from local geological and climatological conditions. Depending on its particular characteristics and mineral composition, soil type will determine what crops will grow best as well as site suitability for various densities of land development. The availability and quality of groundwater is also governed by the permeability and porosity of the underlying rock.

The geology of the County has evolved over a long period of time primarily through the geologic processes of plate tectonics and erosion. In brief, the North American Plate, of which Fauquier County belongs, has for hundreds of millions of years collided with, separated from, and slid past other tectonic

plates. Each time two or more plates collide, volcanic activity results and large rock formations are thrust and folded over one another. The resulting mountain forming process is referred to as an orogeny. After a time, collided plates or previously contiguous plates may rip apart and an ocean forms between them. More volcanic activity then takes place, filling shallow seas and covering the land with volcanic ash and debris and intruding surrounding rock with magma. During separation, jumbled slivers of the colliding continents are left as a testament to the collision. As volcanic activity subsides, the erosive processes of water and wind take hold and grind the landscape, forming river valleys, creating alluvial fans, and filling in low lying areas. Table 2.1 presents a geologic timeline for the formation of present day Fauquier County along with the associated events that helped shaped it.

The County is divided into three geological provinces including the Blue Ridge Anticlinorium, the Culpeper Basin, and the Piedmont Province. The Blue Ridge runs from the Blue Ridge Mountains to Pond Maintain and Baldwin Ridge. To the east of the Blue Ridge lies the Culpeper Basin. East of the Culpeper Basin lies the deeply weathered, rolling lands of the Piedmont Province. Each geologic formation has a unique geological history and has a distinctive landscape signature. Each area also consists of a different assortment of rocks and minerals which are valuable resources to the County. Maps 2.2A (*Blue Ridge Anticlinorium*), 2.2B (*Culpeper Basin*), and 2.2C (*Piedmont Province*) present a geological picture of the County which is divided between the geological provinces and their constituent formations.

Subsurface Hydrology

Of all the earth's resources, water is the most critical for the support of life. Water is also an integral component of many commercial, industrial, and recreational activities. Unlike many other naturally occurring resources such as mineral deposits and energy sources, water is a renewable resource. Fresh water supplies are continually renewed through the cycle of evaporation, precipitation, and the flow of water over the surface of the earth. In addition to surface water supplies, subsurface water supplies, or groundwater, are found in almost all areas of the earth's crust at varying levels below the surface.

While some rainwater in Fauquier County falls onto the land and flows into streams and lakes, much of this water slowly percolates down through the soil horizon until it reaches an impervious layer of rock. The water then builds up above this impervious layer of rock, filling all the cracks and openings and saturating the layer or layers of pervious material (rock, saprolite, and soil). The rock and soil become saturated up to a certain level, and the upper limit of this zone of saturation is known as the water table.

In general, water below the water table slowly flows toward sea level. The rate of flow is determined by

the amount of the permeability of the sediment or rock through which it flows, and the slope and configuration of the surface and underlying geology. The permeable layers of sediment which serve as the conduits for groundwater are called aquifers.

Aquifers fall into two categories, consolidated and unconsolidated. Consolidated aquifers are found in saturated rock formations where water is contained within the void spaces in the formations. The water is contained in interconnected pore spaces within the rock and can be transmitted through cracks, fissures, or solution cavities. An aquifer's porosity is a measure of the total amount of void space, its permeability refers to the interconnectedness and size of those voids and describes how readily water will flow through the material. In consolidated aquifers, the water's ability to pass through interconnected voids establishes the aquifer's primary permeability. Secondary permeability refers to the cracks and fissures which serve to transmit water through bedrock. The most significant consolidated aquifers occur in sedimentary rocks such as sandstone, limestone, and dolomite which have high primary and secondary permeability levels. Crystalline igneous and metamorphic rocks contain only secondary porosity and generally are lower water producers.

Since pressure increases with depth, the number and width of cracks and fissures in rock formations decrease with depth and thereby reduce the likelihood of reaching water the deeper one drills into a consolidated aquifer.

There are two types of consolidated aquifers; unconfined and confined. Unconfined aquifers are found above the first impervious layer of rock and are the most common source for wells. Confined aquifers are found between two impervious rock layers. If a well should reach into a confined aquifer, the hydraulic pressure within that aquifer may be great enough that the water will flow freely out of the well without the use of a pump. These wells are known as artesian wells. Some of the problems associated with the use of groundwater as a source of fresh water are as follows:

- When sediment and rock are not very permeable, water will flow into aquifers so slowly that it will not be able to be removed at an efficient rate.
- If groundwater is withdrawn more quickly than it can be recharged then the water table will drop and ultimately wells will need to be drilled deeper. It must also be recognized that although groundwater is a renewable resource, that renewal may take hundreds of years. In essence rapid depletion of groundwater in some cases may resemble the extraction of a nonrenewable resource.
- Groundwater may dissolve and absorb salts and other minerals which may render it unsuitable for human consumption.

One of the most common problems associated with groundwater is that of contamination by man-made substances such as pesticides and heavy metals. Once contamination has taken place, it is often economically infeasible, or impossible, to correct the situation. Sources and causes of groundwater contamination include leaking storage tanks, over application of pesticides, failing septic tanks, and improperly constructed wells.

Geology as it Relates to Hydrology

The amount and quality of groundwater found throughout the County varies greatly due to the type and configuration of the County's geology. This section will examine the various types of rocks found in differing areas of the County as well as their observed and potential water bearing properties.

Igneous and metamorphic rocks, which form consolidated aquifers and are generally of secondary porosity, are typically low producers of groundwater. The success of wells drilled in these rocks is dependent upon encountering water filled fractures which usually occur within the first 250 feet. Yields from these rocks are generally less than 30 gallons per minute, although yields of 50 gallons per minute or more are not uncommon. In a few cases yields exceeding 100 gallons per minute have been realized in Fauquier.

Metamorphic rocks and granites have a relatively better potential for groundwater than other crystalline rocks. A 350 foot deep well supplying the Town of Warrenton was reported to produce 28 gallons per minute in 1970. Another well in the same area tested at 400 gallons per minute. A 445 foot deep well at Marshall has been reported to produce 15 gallons per minute, and a well drilled for public supply near Middleburg in 1971 delivered 150 gallons per minute during a 24-hour pumping test. The depth of this well was 350 feet and drawdown was 345 feet. All of these wells were drilled through metamorphic rock, granite, or both.

Diabase rock which is characteristically dense and impermeable is an extremely poor source of water and should be avoided in development of groundwater supplies. However, two wells drilled through this rock to depths exceeding 800 feet near Bealeton in 1971 were successful.

Greenstone, which is widely exposed in the north-western portion of the County, generally does not produce large amounts of groundwater and should only be used for small domestic needs. Map 2.3 (*Near-Term Potential Water Supply Sheds*) shows areas of the County according to their near term groundwater supply potential.

Fauquier County, in 1990, working jointly with the County Water and Sanitation Authority, contracted

with the firm Emery & Garrett Groundwater, Inc. to conduct a two phase hydrogeologic investigation to determine groundwater availability for public water systems in the New Baltimore and Bealeton service districts. Phase One of the investigation entailed preliminary recommendations for potential test well sites. Phase Two, which will be competed in fiscal year 1994, will cover yield potentials for drilled wells.

Water Features

All surface water in Fauquier County, with the exception of some water flowing to the Rappahannock River, originates within the County. The Rappahannock River, which has its headwaters in the extreme western portion of the County, the centerline of which forms the County's western boundary, drains large areas to the west of the County and, therefore, not all of the water in the Rappahannock originates within the County. This fact will be significant in the future because Fauquier may look to the Rappahannock River for the purposes of discharging additional treated sewage effluent, water supply, or both. Due to the river's function as a western boundary for the County, water quality in the upper section of the river is dependent upon the actions of several jurisdictions including: the towns of Warrenton, Culpeper, Washington, and Remington; and the counties of Rappahannock, Culpeper, and Fauquier. The actions of these jurisdictions not only impact the river in terms of providing quality water for these areas, their actions will also impact downstream users of this water resource, namely the City of Fredericksburg.

The Virginia Water Control Board (VWCB), which is now the Department of Environmental Quality (DEQ), prepared a Draft Water Quality Management Plan for the Rappahannock River Basin (September 1987) to fulfill the requirements established in the Federal Clean Water Act and the State Water Control Law. The purpose of the plan was "to provide a management tool to assist the State in attaining and maintaining the applicable water quality goals in the Basin. The Plan identifies water quality problems in the Basin and sets forth a remedial action program to alleviate these problems..."

The Draft Water Quality Management Plan identified a wide variety of problems in portions of the Rappahannock and its tributaries in Fauquier and neighboring counties which included elevated suspended solids and bacterial levels as a result of malfunctioning sewage treatment plants (STP), chronic toxicity levels of lead, elevated arsenic and copper levels in associated groundwater, high nickel values based on EPA criteria for water and fish consumption, high nitrate nitrogen levels, and declining benthic populations which is an indication of the general decline in water quality.

Fauquier County has contributed to some of these problems both from point sources (primarily STPs) and non-point sources (primarily agriculture). There are four STPs in the County: Marshall/The Plains, Warrenton, Vint Hill, and Remington. All except Vint Hill discharge either directly into the

Rappahannock or into one of its tributaries. The Vint Hill STP discharges into the Occoquan Watershed. Each of these facilities has operated in the past, and Vint Hill is currently, under a Consent Order from the DEQ to correct effluent quality problems which were mostly the result of inflow/infiltration (1/1) problems. Similar actions have been underway in neighboring jurisdictions contributing to the same watersheds.

With regard to the Rappahannock watershed, the County and the Water and Sanitation Authority (WSA) are currently taking corrective action to comply with the Consent Orders in the form of expanded and corrected STPs. The DEQ intends to use the findings of the Water Quality Management Plan to evaluate future effluent contributions to the watershed. There has been some discussion at the DEQ of designating the Rappahannock as a "Tier 3" river. This classification would preclude new or expanded effluent discharges in designated sections of the river. This is significant due to the effect this may have in obtaining DEQ approval to expand the existing County and Town sewage treatment facilities and to construct any new regional facilities.

Watersheds and Water Supply

Drainage in the County is divided almost evenly between the Rappahannock and the Potomac rivers. The major subdivisions of the Potomac watershed are defined by the drainage areas of Goose Creek, Occoquan Creek, and Aquia Creek. The Occoquan watershed comprises approximately one-third of the County's total land area. This is significant due to the special restrictions imposed by the Virginia Water Control Board on localities within that watershed. The restrictions are embodied in a document known as the "Occoquan Policy" which was enacted to protect the quality of the water supply in the Occoquan Reservoir. This impoundment, which forms the boundary between Fairfax and Prince William counties, serves as the primary water supply for over 800,000 Northern Virginians. The most significant requirements driving the "Occoquan Policy" are the requirements for high-performance regional waste-water treatment facilities, a limit to the number of treatment facilities allowed within the watershed, and the stringent effluent water quality standards which must be achieved.

The County has further recognized that the watersheds within the County are also valuable resources. In 1982, Fauquier County endorsed the goals of the Occoquan Basin Non-point Pollution Management Program, to maintain "acceptable levels of water quality within the Occoquan Basin's free flowing streams and impoundments" through the application of storm water quality Best Management Practices (BMPs).

The Occoquan watershed portion of the County is divided into three major watersheds that include Cedar

Run, Broad Run, and a small portion of Bull Run. Under the auspices of Public Law 92.566, and with the assistance of the Soil Conservation Service (SCS), the County is pursuing a water impoundment construction program in the Cedar Run subwatershed. Map 2.3 shows those potential water supply sheds from which the County intends to provide water for its near term potential needs. Map 2.4 (*Hydrologic Units*) shows the primary watersheds in the County and the subwatersheds, also known as hydrologic units, as defined by the Soil and Water Conservation District.

There are three multifunction impoundments planned for the County which are designed to provide all or some of the following benefits: flood control, water supply, and recreation. The first of these projects, Germantown Lake, was completed on Licking Run in 1986, and was dedicated in June 1987. The Town of Warrenton cooperated with the SCS to complete, in 1991, a project up-stream from the existing Town reservoir near Airlie. Another project, the Auburn Dam, is scheduled to follow the Airlie Impoundment.

The County purchased land on Carter Run (Rappahannock watershed) under the same PL- 566 program in 1974; however, the SCS has dropped this dam site from their project list. The Carter Run site was eliminated as a possible impoundment site due to the fact that there would not be enough flood protection downstream to justify it and that the site would no longer meet federal funding criteria. In 1990 the County hired the engineering firm of Dewberry and Davis to complete a study of surface water impoundment sites within the County (further discussion of this study can be found in Chapter 9). Dewberry and Davis identified another site on Carter Run immediately south of the existing site which they estimated could generate 4 million gallons of water per day. The site is located such that it could supply service districts at Marshall, and possibly Warrenton and New Baltimore. The former Carter Run site could still be utilized by the County in the form of a wetlands mitigation area and a water quality management area for a future impoundment downstream.

Floodplains

Floodplains are a valuable resource, which provide a necessary interface between land and water. Their use or non-use is critical with respect to water quality and aquatic life. Floodplains are susceptible to flooding and by definition store water and accommodate fluctuations in stream volume during heavy rains. The limitations for certain types of development within floodplains include: financial loss, personal harm, and even loss of life.

For many reasons, floodplains have attracted urban development throughout time. Fertile alluvium deposited during flooding attracts farming and other activities, the proximity to nearby streams provides a means of transportation and waste disposal as well as a constant water supply, and flat terrain is

conducive to dense development. However, while the actual stream bed occupies only a small portion of the floodplain, heavy rains or snowmelts may cause the stream to flood over its banks. Since floodplain terrain is relatively flat, even a small increase in water level may inundate acres and even miles of land area.

Urbanization is a primary contributing factor to increased flooding. The process of urbanization tends to restrict a stream's natural flow through channelization and infill, resulting in higher water velocities and less stream channel volume. Furthermore, the increased imperviousness of the surrounding land area results in less infiltration of rainfall into the soil and more storm water which flows directly into the stream channel. The result is a higher "peak" flow, which means that a higher volume of water enters the stream channel at one time and at a higher velocity. Damage is caused by the increased erosive powers of the floodwaters, the impact of the water itself on structures, the deposition of sediment and debris as floodwaters recede, and the potential contamination of water supplies.

In addition to the potential for damage caused by flooding, soils within floodplains often have limited development potential due to high water table, wetness, and poor load bearing capacity which limits the use of septic systems and may require special engineering to ensure the structural stability of buildings and roadways.

While safety from the damaging effects of floods is a major reason to implement a thoughtful floodplain management plan, floodplains also provide a number of valuable benefits. Floodplains serve in many cases as groundwater recharge areas. They are also sensitive ecological areas from the standpoint of being the source of food and habitat for stream organisms and larger species. In many cases, because of their ability to hold water and reduce runoff, they serve as an effective flood control device by reducing flooding.

Most of the floodplain in Fauquier County abuts streams and creeks. As time passes, floodplains modify and thus must be considered in relation to future development. Soil information provides the initial data for floodplain delineation. Alluvial soil deposits represent historical data and in many cases provide a conservative estimate of the actual floodplain.

The potential harm of unplanned urban development in floodplains has been increasingly recognized over the last century, and floodplain management has now become a common land use tool. Floodplain management is also important because in many cases, alterations in the floodplain will impact more severely on downstream properties rather than on the altered property.

Floodplain areas have been generally identified in studies conducted by the Federal Emergency Management Administration (FEMA). These studies, which are largely for flood insurance purposes, result in maps which identify the one hundred year floodplain and flood prone areas. In addition, stream sections in highly developed areas with historic flooding problems have been studied in detail by FEMA. The detailed FEMA maps show floodways, 100 and 500-hundred year floodplains, and flood-prone areas. As watersheds develop, and the percentage of impervious surface increases, the County should require more detailed flood evaluations than those provided by the general FEMA studies.

In order for its residents to qualify for flood insurance under the FEMA program, and to protect the public health, safety, and general welfare of its citizens, Fauquier County adopted a Floodplain District overlay as part of its Zoning Ordinance in 1983 (Fauquier County Zoning Ordinance, Article 4, Part 4). The Floodplain District governs the type and extent of development and redevelopment within designated floodplain district boundaries and should be consulted for more specific details.

Protection of Water Supplies

Legislation adopted by the Virginia General Assembly during its 1987 session contained two bills which concerned local government responsibilities for addressing water usage. House Bill 919 amended Section 15.1-447 of the Code of Virginia to include surface and groundwater studies to the list of surveys necessary for preparing comprehensive plans. House Bill 920 amended Section 15.1-489 of the Code to include the protection of groundwater with the list of purposes for local zoning ordinances.

There are no comprehensive studies detailing the County's water resources at the time of this writing. In 1988, the Virginia Water Control Board released three studies concerning water supplies within Fauquier County: Rappahannock River Basin Water Quality Management Plan, the Rappahannock Water Supply Plan, and the Potomac Water Supply Plan. The Water Quality Management Plan addresses the existing quality of water, sources of possible pollution, and estimated sewage treatment plant expansions for the Rappahannock watershed. The scope of the study is extremely broad and is of limited use to the County from the standpoint of future water usage. The two water supply plans contain information regarding existing water usage in public systems and estimates for future water usage in terms of quantity; however, they do not address the adequacy of water sources in the form of a detailed hydrologic or hydrogeologic study. Without such detailed information it is virtually impossible to predict whether or not existing water sources will provide the estimated amount of water which will be required given estimates of future population.

The critical areas of need within the County with respect to detailed information regarding water sources

are the Marshall and the New Baltimore areas. Remington and Bealeton presently do not have adequate source capacity to serve future demands; however, they are located in areas where groundwater resources are more reliable and the Germantown Lake impoundment can provide additional water as needed by raising the level of the dam.

In order to know more precisely the extent of the groundwater resources within the County, and before the County can take measures to protect the quality and use of this resource, more detailed studies will be required. It is anticipated that such studies will be undertaken during this planning period.

Groundwater Supplies

In 1991, Fauquier County contracted with the engineering firm of Emery & Garrett Groundwater, Inc. to conduct an investigation of groundwater resources in the New Baltimore and Bealeton service districts. The purpose of the survey was to find good quality drinking water with enough quantity to provide public drinking water for these two service districts. These two areas of the county are areas which have a high concentration of population and have been experiencing problems with water quantity and/or quality. The preliminary findings of the Emery & Garrett study concluded that groundwater resources for the New Baltimore area appear to be less abundant than originally believed and may require augmentation from developed surface water sources to meet demand in the Service District. The final findings from that study will become a part of this Comprehensive Plan, and may form the basis of a County-wide Master Water Plan. Groundwater resources can be developed at much less expense than surface water resources.

Soils

The characteristics of the soils and parent materials in Fauquier County reflect the varied surface geology of the County and include upland, terrace land, old colluvial slope, recent colluvial slope, and bottom land soil groupings. The quality of soil for agricultural and forestal purposes varies greatly within the County; however, much of the land area is well suited for agricultural and forestal production.

Much of the technical analysis in this section relies upon the Soil Survey, Fauquier County Virginia, issued August 1956 and conducted by VPI and the Soils Conservation Service. Although it is widely accepted that this source is not site specific, the data contained in the study is the best available and with proper interpretation it will serve well for planning purposes. The County hired a soil scientist in 1989 to update the Soil Survey which will provide more usable soil maps and better interpretive information. Methodology for locating soil types for the following uses can be found in Appendix B.

Prime Agricultural Soils

Prime agricultural soils consist of those soils which have been identified as Class 1, 2 or 3 by the Soil

Conservation Service. These soils, which have been designated by the Office of the County Soil Scientist as prime cropland, secondary cropland, or prime pasture, are recognized as prime agricultural soils throughout the County. They are well suited to row crops and/or hay and pasture. These soils have less than a 15% slope, and have sufficient fertility and suitable characteristics to produce crops in an economical manner.

In non-designated growth areas of the County, the subdivision process requires the clustering of dwellings to preserve 85% of the aggregate in contiguous open space. This requirement benefits all non-designated growth areas including those areas which have prime agricultural soils.

Map 2.5 (*Open Prime Agricultural Soils*) shows in general prime agricultural soils which are not presently covered by forest. Map 2.6 (*Generally Poor Forest Soil*) shows those areas which generally have a low suitability for wood production. The remaining portion of the County contains soil associations which are generally good to excellent for forest production.

Sewerage Limitations

Soils have varying characteristics with respect to the ability to absorb and filter effluent. Rockiness, low depth to bedrock, flooding, high water table, poor or excessive permeability, and steep slopes all limit the soil's filtering ability. Using these factors, Map 2.7 (*Areas with Severe Limitations for Septic Systems*) shows those soil types with severe limitations for any development which must rely upon the use of septic tanks. Due to the substantial variations in soil types and groupings, Map 2.8 (*Highly Erodible Soils*) should be interpreted in a broad context.

Wetlands

Wetlands are an important natural resource for a number of reasons. They serve as habitat and nesting grounds for a variety of species, regulate flood control, remove sediment and impurities from the water, and serve as recharge areas for groundwater aquifers.

Currently, the County indirectly regulates local wetlands. Wetlands are protected under the federal Clean Water Act, Section 404. The U.S. Army Corps of Engineers, which is assigned as the primary federal agency with regulatory authority for these laws, must be consulted and requires issuance of a wetlands permit when any project proposes to develop greater than one acre of wetlands. Delineation of wetlands is determined according to regulations pursuant to the Clean Water Act. Two primary tools for the initial identification of wetlands are National Wetlands Inventory (NWI) maps as well as local soils maps. Soil maps show the location of hydric soil which is one of the indications of jurisdictional wetlands. Through the County's development process, protection of wetland areas is considered in all land development

applications, including subdivisions, rezoning, and special exceptions.

NATURAL RESOURCES AND FEATURES

Fauquier County has some of the most valuable natural resources and features of any of the areas in the Virginia Piedmont. The following sections detail the County's natural resources and features.

Forests

The Northern Piedmont area of Virginia, of which Fauquier County is a part, supports a wide variety of flora and fauna. There are 17 different forest cover types found in varying degrees within the County. According to the United States Forest Service 1992 Forest Survey, Fauquier County has 175,188 acres of forested land all of which are classified as commercial forest land. This land is distributed throughout the County in tracts ranging from a few acres to hundreds of acres in size.

The forest lands within the County not only provide raw materials for forestal industries and an economic income for forest landowners, they also provide environmental benefits to all of the people who reside within the County. These benefits include watershed protection, soil erosion and stream sedimentation control, recreational opportunities, air pollution and noise modification, screening for privacy, wildlife habitats, and general visual beauty.

Approximately 17,000 acres of forest land has been lost to other uses since 1976. Decreases in forest land can be attributed to development pressure, increased housing needs, and population growth. All of these elements contribute to, and influence, land use, ownership patterns, owner tenure, and other management objectives.

The uses of the 175,188 acres of County forest land, as reported in the 1992 Forest Survey, are gradually shifting from the traditional production of forest products, sawtimber, and pulpwood, to a blend of forest products and environmental benefits. This blend was accomplished by establishing trees on particular pieces of land for the purposes of soil erosion control, watershed protection, the reduction of air and noise pollution, and general beautification of property.

Map 2.9 (*Forest Cover*) shows those areas of the County presently covered by woodlands.

Steep Slopes

Although steeply sloping areas can provide breathtaking vistas and are often sought after for residential development, they are also areas of special concern and are very sensitive to development. Generally, steep sloped areas are quite susceptible to erosion. The amount of susceptibility and erosion which may

occur varies according to the amount of rain, length of slope, ground, cover, grade, and the erosion characteristics of the soil type. For example, erosion from a 25% slope can be as much as 15 times that from a 4% slope.

Another major slope related problem is the amount of rainfall which does not soak into the ground, known as "storm water runoff". Two items need to be examined in relation to storm water runoff. The first is direct runoff and the second is peak discharge. Direct runoff is the amount and velocity of water which runs off of a given area. Direct runoff is critical from a downstream landowner's viewpoint. Peak discharge is the amount of runoff at the height of the discharge. Decreasing the vegetative cover, increasing the impervious surface, or both will result in an increase in the amount of runoff as well as an increase in the peak discharge. The increase in runoff and in peak discharge can significantly alter flood conditions downstream. Map 2.10 (*Slopes Between 14 Percent and 25 Percent*) and Map 2.11 (*Slopes 25 Percent and Over*) show slopes between 14%- 25% and 25% and over.

Scenic Areas

Scenic beauty is a resource which is often difficult to quantify, yet once disturbed it is often impossible to recapture. Areas of scenic beauty abound within Fauquier County. Some scenic areas are undisturbed, rugged, and natural in their state. Other areas of scenic beauty are man-made and many include settlement areas. Still other areas of such beauty are a combination of natural and man-made forces such as farmlands.

In an attempt to identify those places and areas considered most scenic, a Scenic Analysis Study was conducted by the County in 1974 to determine if there was any basis for general agreement as to what constituted scenic wild lands, agriculture lands, and settlement areas. Through a photographic analysis and a comparison made of these photographs by a number of laymen and professionals, it was determined that there was a substantial amount of agreement as to what constituted the best and worst in each of the above- mentioned categories. There was much less agreement in determining the boundaries or criteria between categories. Based on the results of this study, the entire County was inventoried and those areas ranking in the top categories were delineated as scenic areas.

The 1974 study has also been utilized to determine the impact of major residential developments in rural areas. Such developments are considered in terms of their impact on areas with a 'scenic rating.' Where impacts are deemed to exist, site improvements including streets and lot layout must take advantage of topography so as to diminish adverse visual impacts and maintain, to the best extent possible, the scenic qualities of the area.

It is recommended that a new Scenic Analysis Study be performed since a number of physical changes in the landscape which have occurred since the time of the original study. Specific development and design standards should be included in County ordinances and regulations to ensure development which results in the lowest impacts on these scenic areas.

The scenic roads identified as a result of the study should be considered for inclusion in a County Scenic Road classification, if one should be adopted by the County. This classification would be similar to the State's Scenic By-Way designation and carry with it specific requirements for development that would visually or physically impact the corridor. The visual corridor for Interstate Route 66 should also be included in such a classification. The area of visual impact for the 1-66 corridor is indicated on Map 2.12 (*Interstate Route 66 Area of Immediate Impact*).

By using Map 2.13 (*Scenic Roads and Areas of Impact*) and State Routes 802 and 626, which are designated Virginia State Byways, a basis for comparison was established and scenic roads were identified. Scenic rivers, and their areas of immediate impact, are shown on Map 2.14 (*Scenic Rivers Areas of Impact – Goose Creek, Rappahannock River*).

The County should explore the possibility of establishing rural scenic areas in the form of zoning overlay districts. These districts would assure the protection of existing significant viewsheds and vistas.

Historical Features

Fauquier County contains more than seven hundred sites, places, and areas of historic significance. Identification, categorization, and protection of these historic sites and areas will require further work than that presented in this section. Listed in Appendix C are those places which have been tentatively identified as having national historic significance and those places which have been identified by an inventory conducted by the Virginia Landmarks Commission. The map in Appendix C identifies by number the general location of National Historic Register sites and a sampling of the Landmarks Commission sites.

The Virginia Landmarks Commission inventory of historic buildings and sites is also listed in Appendix C. Among these entries are sites that, because of their low level of significance, do not warrant special protection. However, there are also sites not included in the inventory that, due to their local, state, or national significance, warrant protection. Many of these sites owe their significance to the Civil War.

In order to identify the most important sites within Fauquier County, the County could seek the assistance of local historians and historic societies. A more complete and official list of historic sites in the County

can then be generated which would serve to identify possible future historic districts and rural historic areas. These historic districts and rural historic areas could then be incorporated into the development review process. This could be accomplished by creating historic areas through the use of overlay districts. Such areas could be protected over time, and possibly enhanced to retain their historical significance.